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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,883	12/27/2001	Alberto Pirovano	08719.0200	9928

7590 06/30/2003

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Washington, DC 20005-3315

EXAMINER

LAXTON, GARY L

ART UNIT	PAPER NUMBER
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2838

DATE MAILED: 06/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/026,883

Applicant(s)

PIROVANO, ALBERTO

Examiner

Gary L. Laxton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7. 6) ☐ Other:

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the Underwater optical telecommunication link comprising: at least three submarine cables extended at least partly in a body of water and having first, second and third power feed terminations at respective landing points, each cable comprising at least an optical fiber and a power feed line electrically connected to the respective power feed termination; at least two power stations at the landing points to feed said power feed lines of the submarine cables of claim 12 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-7 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webb (US 5,517,383) in view of Williston (US 4,573,098).

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Concerning claims 1-7 and 9-12, Webb discloses, figure 3, a branching unit for joining power feed lines of at least three submarine cables, comprising: first, second, and third cable terminations (A, B, C) each coupled to a power feed line of a respective submarine cable; a ground termination (figure 3); and first, second, and third high-voltage relays (A1-A3, B1-B3, C1-C3) each having a coil and a contact, the coil of each high-voltage relay being positioned between two of the cable terminations respectively (see figure 3) and having an energized state when a threshold amount of current passes through the coil and a de-energized state when the threshold amount of current does not pass through the coil (normal operation of a relay), the contact of each high-voltage relay being positioned to connect the respective third cable termination with the ground termination when the respective coil is in an energized state and to connect the respective third cable termination with at least another of the cable terminations when the respective coil is in a de-energized state (See figure 3 A Spur, B Spur, C Spur and A1-C1). And wherein the first, second, and third high-voltage relays each further comprise a second contact (A1-A3, B1-B3, C1-C3) being positioned to de-couple one of the two cable terminations from the third cable termination when the respective coil is in an energized state. The first, second, and third high-voltage relays are arranged between the cable terminations in a delta network (figure 3). The respective terminations have at least one zener diode arranged in parallel with the first, second, and third high-voltage relays (Figure 3: 21). And lastly, wherein the first, second, and third high-voltage relays further comprise a diode bridge surrounding the coil (see figure 3: 31', 31'', 31''').

However, Webb does not disclose a current limiter positioned in series between the ground termination and sea earth; wherein the current limiter comprises an inductor; wherein the

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inductor comprises an air bobbin; wherein the inductor has an inductance of greater than 100  $\mu$ H; wherein the inductor has an inductance of greater than 1 mH.

Williston teaches of a power supply system having a grounded neutral and having a ground voltage suppression device comprising an inductor or non-linear impedance connected between a secondary neutral conductor and a normal ground conductor to define a neutral to ground current path which presents a high impedance to current flow (e.g. current limit) (abstract, col. 3 lines 10-60).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a current limiter in the circuit of Webb comprising an inductor or air bobbin (non-linear device) positioned in series between the ground termination and sea earth in order to protect against current by providing a neutral to ground (ground to sea earth) path which presents a high impedance to the current flow therethrough in order to protect circuit components from destruction due to high current through the circuit as taught by Williston.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize an inductor with an inductance of greater than 100  $\mu$ H (including an inductance of greater than 1 mH) in order to provide sufficient protection while maintaining an appropriate sized inductor to conserve precious spaced requirements since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205, USPQ 215 (CCPA 1980).

Claim 11. A branching unit for joining power feed lines of at least three submarine cables, comprising: first, second, and third cable terminations each coupled to a power feed line of a respective submarine cable (Figure 3; 1, 2, 3); a ground termination (A1, B1, C1, D1); and a

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switching apparatus (relays: A, A1, B, B2, C, C1) positioned between the first, second, and third cable terminations (1, 2, 3) and the ground termination (A1, B1, C1, D1); the apparatus causing the third cable termination to connect with the ground termination when a threshold amount of current flows between the first and second cable terminations (Figure 3; 1, 2, 3, A1, B1, C1, D1; and normal operation of a relay).

However, Webb does not disclose a current limiter positioned in series between the ground termination and sea earth.

Williston teaches of a power supply system having a grounded neutral and having a ground voltage suppression device comprising an inductor or non-linear impedance connected between a secondary neutral conductor and a normal ground conductor to define a neutral to ground current path which presents a high impedance to current flow (e.g. current limit) (abstract, col. 3 lines 10-60).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a current limiter in the circuit of Webb positioned in series between the ground termination and sea earth in order to protect against current by providing a neutral to ground (ground to sea earth) path which presents a high impedance to the current flow therethrough in order to protect circuit components from destruction due to high current through the circuit as taught by Williston.

Claim 12. Underwater optical telecommunication link (figure 3) comprising: at least three submarine cables and having first, second and third power feed terminations (figure 3: 1, 2, 3), each cable comprising at least an optical fiber (abstract) and a power feed line electrically connected to the respective power feed termination; and a branching unit for joining said power

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feed lines of said submarine cable (figure 3), wherein the branching unit comprises: first, second, and third cable terminations (1, 2, 3) each coupled to a power feed line of a respective submarine cable; a ground termination (A1, B1, C1, D1 connection); and a switching apparatus positioned between the first, second, and third cable terminations and the ground termination, the apparatus causing the third cable termination to connect with the ground termination when a threshold amount of current flows between the first and second cable terminations.

However, Webb does not disclose a current limiter positioned in series between the ground termination and sea earth.

Williston teaches of a power supply system having a grounded neutral and having a ground voltage suppression device comprising an inductor or non-linear impedance connected between a secondary neutral conductor and a normal ground conductor to define a neutral to ground current path which presents a high impedance to current flow (e.g. current limit) (abstract, col. 3 lines 10-60).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a current limiter in the circuit of Webb positioned in series between the ground termination and sea earth in order to protect against current by providing a neutral to ground (ground to sea earth) path which presents a high impedance to the current flow therethrough in order to protect circuit components from destruction due to high current through the circuit as taught by Williston.

4. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webb (US 5,517,383) in view of Muelleman (US 5,781,386).

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Concerning claims 1-7 and 9-12, Webb discloses, figure 3, a branching unit for joining power feed lines of at least three submarine cables, comprising: first, second, and third cable terminations (A, B, C) each coupled to a power feed line of a respective submarine cable; a ground termination (figure 3); and first, second, and third high-voltage relays (A1-A3, B1-B3, C1-C3) each having a coil and a contact, the coil of each high-voltage relay being positioned between two of the cable terminations respectively (see figure 3) and having an energized state when a threshold amount of current passes through the coil and a de-energized state when the threshold amount of current does not pass through the coil (normal operation of a relay), the contact of each high-voltage relay being positioned to connect the respective third cable termination with the ground termination when the respective coil is in an energized state and to connect the respective third cable termination with at least another of the cable terminations when the respective coil is in a de-energized state (See figure 3 A Spur, B Spur, C Spur and A1-C1). And wherein the first, second, and third high-voltage relays each further comprise a second contact (A1-A3, B1-B3, C1-C3) being positioned to de-couple one of the two cable terminations from the third cable termination when the respective coil is in an energized state. The first, second, and third high-voltage relays are arranged between the cable terminations in a delta network (figure 3). The respective terminations have at least one zener diode arranged in parallel with the first, second, and third high-voltage relays (Figure 3: 21). And lastly, wherein the first, second, and third high-voltage relays further comprise a diode bridge surrounding the coil (see figure 3: 31', 31'', 31''').

However, Webb does not disclose a current limiter positioned in series between the ground termination and sea earth; wherein the current limiter comprises an inductor; wherein the



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inductor comprises an air bobbin; wherein the inductor has an inductance of greater than 100  $\mu$ H; wherein the inductor has an inductance of greater than 1 mH.

Muelleman teaches, figure 3, a low level ground conditioning circuit (178) having a grounded neutral (G of 32) and earth ground (SG) and an inductor in parallel with a resistor (180, 182) connected in series between the earth ground (G) and safety ground (SG) in order to choke high frequency transient currents (e.g. limit current or current limiter) (col. 6 lines 15-40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a current limiter in the circuit of Webb comprising an inductor or air bobbin (non-linear device) positioned in series between the ground termination and sea earth in order to protect against transients currents by choking high frequency transient currents (e.g. limit current or current limiter) with an impedance conditioning circuit having an inductor in parallel with a resistor and connected between a ground and earth ground connection in order to protect circuit components from destruction due to high current transients through the circuit as taught by Muelleman. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize an inductor with an inductance of greater than 100  $\mu$ H (including an inductance of greater than 1 mH) in order to provide sufficient protection while maintaining an appropriate sized inductor to conserve precious spaced requirements since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205, USPQ 215 (CCPA 1980).

Claim 11. A branching unit for joining power feed lines of at least three submarine cables, comprising: first, second, and third cable terminations each coupled to a power feed line of a

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respective submarine cable (Figure 3; 1, 2, 3); a ground termination (A1, B1, C1, D1); and a switching apparatus (relays: A, A1, B, B2, C, C1) positioned between the first, second, and third cable terminations (1, 2, 3) and the ground termination (A1, B1, C1, D1); the apparatus causing the third cable termination to connect with the ground termination when a threshold amount of current flows between the first and second cable terminations (Figure 3; 1, 2, 3, A1, B1, C1, D1; and normal operation of a relay).

However, Webb does not disclose a current limiter positioned in series between the ground termination and sea earth.

Muelleman teaches, figure 3, a low level ground conditioning circuit (178) having a grounded neutral (G of 32) and earth ground (SG) and an inductor in parallel with a resistor (180, 182) connected in series between the earth ground (G) and safety ground (SG) in order to choke high frequency transient currents (e.g. limit current or current limiter) (col. 6 lines 15-40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a current limiter in the circuit of Webb positioned in series between the ground termination and sea earth in order to protect against transients currents by choking high frequency transient currents (e.g. limit current or current limiter) with an impedance conditioning circuit having an inductor in parallel with a resistor and connected between a ground and earth ground connection in order to protect circuit components from destruction due to high current transients through the circuit as taught by Muelleman.

Claim 12. Underwater optical telecommunication link (figure 3) comprising: at least three submarine cables and having first, second and third power feed terminations (figure 3: 1, 2, 3), each cable comprising at least an optical fiber (abstract) and a power feed line electrically

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connected to the respective power feed termination; and a branching unit for joining said power feed lines of said submarine cable (figure 3), wherein the branching unit comprises: first, second, and third cable terminations (1, 2, 3) each coupled to a power feed line of a respective submarine cable; a ground termination (A1, B1, C1, D1 connection); and a switching apparatus positioned between the first, second, and third cable terminations and the ground termination, the apparatus causing the third cable termination to connect with the ground termination when a threshold amount of current flows between the first and second cable terminations.

However, Webb does not disclose a current limiter positioned in series between the ground termination and sea earth.

Muelleman teaches, figure 3, a low level ground conditioning circuit (178) having a grounded neutral (G of 32) and earth ground (SG) and an inductor in parallel with a resistor (180, 182) connected in series between the earth ground (G) and safety ground (SG) in order to choke high frequency transient currents (e.g. limit current or current limiter) (col. 6 lines 15-40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a current limiter in the circuit of Webb positioned in series between the ground termination and sea earth in order to protect against transients currents by choking high frequency transient currents (e.g. limit current or current limiter) with an impedance conditioning circuit having an inductor in parallel with a resistor and connected between a ground and earth ground connection in order to protect circuit components from destruction due to high current transients through the circuit as taught by Muelleman.

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5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Webb and Williston and further in view of Carlson.

Webb and Williston disclose the claimed subject matter as stated above in regards to claim 6 except for wherein the current limiter further comprises at least one resistor in parallel with the inductor.

Carlson teaches, figure 5, connecting a resistor (102) in parallel with an inductor (110) and connecting that parallel combination between a ground (28) and an earth ground (18) in order to provide a ground filter circuit (col. 7 lines 6 and 7).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Webb with the teaching of Williston and to further modify the combination circuit of Webb and Williston by connecting a resistor in parallel with the inductor in order to provide a protecting device to protect against current and voltage transients and to provide a ground filter circuit as taught by Carlson.

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 5,491,368 Yamamoto discloses a branching unit using a resistor and relay to avoid hot swapping phenomenon due to the charge stored on the cable.

US 5,655,036 Webb discloses a branching unit with a current sense circuit connected between ground and sea earth.


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US 6,157,098 Kojima et al disclose a feed line connection circuit and optical transmission system having branch and trunk substations.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L. Laxton whose telephone number is (703) 305-7039. The examiner can normally be reached on Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on (703)308-1680. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7724 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
6/26/07  
MICHAEL SHERRY  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800

GLL  
June 25, 2003